THE

Saturday Magazine.

№ 735. DECEMBER 16TH, 1843. Price One Penny

THE ROYAL RESIDENCES OF SCOTLAND.

V.

DUNFERMLINE.

The celebrated abbey of Dunfermline has attracted far more notice than the palace of the same name. The religious foundation is indeed of great antiquity. A priory was erected here by Malcolm Canmore, which was afterwards, by David the First, about the year 1124, raised to the dignity of an abbey. In 1244 it was admitted by the Pope to the honour of being a mitred abbey. In the abbey church the Kings of Scotland were interred.

The grandeur and magnificence of this edifice was such, that in the words of an old historian, it might be said "to contain many royal palaces within itself, so that three distinguished sovereigns, with their different suites, could all, at the same time, be accommodated in it without causing the slightest inconvenience the one to the other." Here Edward the First, with his queen and court, passed the winter of 1303. "Therefore," says the writer, just quoted, "on account of the excessive extent of the place, the Scottish nobles were wont to assemble here, and to frame their machinations against the King of England; and the greatest part of them, in the time of war, breaking forth as from places of ambush, addicted themselves to robberies and slaughter of the English people. The king's army, therefore, seeing that the temple of the Lord was not a church, but a den of thieves, as a beam in the eye of the English nation, applying to the walls the line of consumption, thoroughly wasted it, levelling all the palaces with the soil. The church, however, and a few small houses, properly becoming monks, were preserved from the flames." Dr. Jamieson suggests, that the reason for this brutal act of violence was the envy with which the haughty Norman viewed this magnificent structure, which is said at that time to have been the greatest and noblest in Scotland. It is difficult to see how the destruction of a cathedral could arrest the meetings of the nobles of Scotland, or prevent them from plotting against the usurpations of Edward.

After this cruel visitation, the abbey never again attained its former splendour. Its remains were demolished at the Reformation; for "vpoun the 28th day" of March, 1560, "the wholl lordis and barrones that war on this syd of Forth, passed to Stirling, and be the way kest [cast] down the abbey of Dumfermling." Scarcely a vestige of the abbey now remains, except a large and elegant window which belonged to the Frater hall or Refectory. Beneath the Fratery there were twenty-six cells, many of which, says Mr. Chambers, still remain with the windows built up. The people have an idea that there are a great many subterraneous passages and cells under both the abbey and palace. One large souterrain is at this day accessible by a stair descending from the east end of the palace. It is commonly called "the Magazine." A range of Gothic pillars supports the middle, and there is a passage up to the church, which James the Sixth is said to have generally used when he desired to go thither incognito. A considerable part of the ground, on which the abbey buildings formerly stood, was converted by James the Sixth into a bowling green.

From the time of Malcolm Canmore till the departure of the royal family to England, Dunfermline continued to be the occasional residence of the Scottish kings. Malcolm Canmore resided here in a tower or castle, of which a small fragment yet remains, once part of a wall, but now almost level with the ground. The steep eminence on which the castle was built rises abruptly out of a glen, and causes the rivulet to wind round its base, thereby forming a peninsula. Hence the name of Dunfermline has been traced to the Celtic Dun-fiar-lynn, or "the Fortified hill by the Crooked Stream." The summit of this hill commands a view of no fewer than fourteen different counties. A little to the south-east of this tower, and in a spot adjoining the abbey, a palace was erected in 1500 by James the Fourth. The architecture is said to have been as elegant as the situation was romantic. The south-west wall is all that now remains of this fabric; and tradition continues to point out the chimney of the apartment where that unfortunate monarch Charles the First was born. The bed in which he was born continued many years in the public inn of Dunfermline, and was then removed to Broomhall, the seat of the Earl of Elgin, two miles from the town. It is a large four-posted bed, and was brought by the Queen from Denmark, together with a press or cupboard, which is now at Pittencrief House, about half-a-mile from the town.

Mr. Chambers, in his *Picture of Scotland*, on the authority of the people of Dunfermline, relates a curious anecdote of the infancy of King Charles. "Charles was a very peevish child, and used to annoy his parents dreadfully by his cries during the night. He was one night puling in his cradle, which lay in an apartment opening from the bed-room of the King and Queen, when the nurse employed to tend him suddenly alarmed the royal pair by a loud scream, followed up with the exclamation, 'Eh, my bairn!' The King started out of bed at hearing the noise, and ran into the room where the child lay, crying, 'Hout tout, what's the matter wi' ye, Nursie?' 'Oh!' exclaimed the woman, 'there was like an auld man came into the room, and threw his cloak owre the prince's cradle; and syne drew it till him again, as if he had ta'en cradle, bairn, and a' away wi' him—I'm feared it was the thing that's no canny.' 'Fiend nor he had ta'en the girnin brat clean awa!' said King James, whose demonological learning made him at once see the truth of the nurse's observation; 'gin he ever be king, there'll be nae gude i' his ring—the de'il has cussen his cloak owre him already.' This story is generally told, and in the same manner, by the aged and more primitive portion of the inhabitants of Dunfermline; the latter part of the King's observation is proverbial in the town—it being common to say to an ill-conditioned person, 'I dare say the de'il has cussen his cloak owre ye.'"

James the Sixth occasionally resided here, so early as the year 1585; for, before the proposal of an alliance by marriage with Denmark, the Danish ambassadors "at Domfermeling—congratulat his Maieste, in the K. their master's name, with a lang discours of the auld amytie, band and mutuall friendschip betwen the twa kingis and ther kingdommes." James the Sixth gave this palace with its land, to Anne his Queen, on the morning after their marriage, at Upslo, in Norway, in 1589, as a morrowing—or morning gift: "this donation," says Jamieson, "not being by way of dowry, on the possession of which she was to enter after the demise of the King, but her present personal property; it appears that she wished to have a mansion of her own, distinct from that which might be occupied by the royal family in general when residing here. As Seton, Earl of Dunfermline, was, in the year 1596 appointed irrevocable keeper, guardian, or constable of the palace of Dunfermline, to take care that 'the palace, with all the edifices belonging to it, should be kept in good order, lest, by negligence, or the injuries of time, it should happen that any of them might fall;' it seems most probable that this had taken place either before or after the royal donation, as to that part of the royal property which was the site of the Queen's house; and that it is said to have been restored from its very foundation by her Majesty, as having been done at her command, and by Lord Dunfermline, her constable, at her expense, out of the revenues arising from his lordship. For, in the charter of the Queen, confirming to him this appointment, he is expressly empowered 'to overlook the workmen employed in the building or reparation of the said palace and edifices of the same, masons, carpenters, slaters, or others, that these buildings might be kept in a proper state at her expense.'"

Charles the First visited Dunfermline in July, 1633, and held a court there. In August, 1650, Charles the Second remained several days in the palace, and here that monarch subscribed the national league and covenant, which was the last occasion of the palace receiving a royal visit. From this time it appears to have been entirely neglected, and in 1708 the roof fell in. It is now a complete ruin; all that remains being the south wall, and a sunk vaulted apartment traditionally called the king's kitchen.

It is generally agreed among historians that the bodies of the following royal personages were buried in Dunfermline: Malcolm the Third, or Canmore, and Margaret his queen; Prince Edward, their eldest son; King Edgar; Alexander the First, and David the First, their other sons; Malcolm the Fourth, David's son; Alexander the Third; King Robert Bruce, and Elizabeth his queen. According to Fordun, Robert Bruce was buried in the middle of the choir. Barbour thus describes his inhumation:—

> They have had him to Dunfermline,
> And him solemnly yirded sine,
> In a fair tomb in the quire,
> Bishops and prelates that were there
> Assoilzed him, when the service
> Was done as they best could devise,
> And syne upon the other day,
> Sorry and wo they went their way;
> And he debowelled was cleanly,
> And also balmed syne full richly;
> And the worthy lord of Douglas,
> His heart, as it forspoken was,
> Received has in great dewtie,
> With fair and great solemnitie.

The fair tomb alluded to in the above passage was a monument of marble prepared for Bruce before his death. Ages passed on, and both church and monument having given way to time, a more modern building was erected on the ancient site. This, however, had become so much dilapidated that it was necessary to take it down; and in clearing the foundations for a third church the workmen laid open a tomb, which was found to be that of Robert the Bruce. The leaden coating which enclosed the body was twisted above the head into the shape of a rude crown. A rich cloth of gold, in a state of great decay, was thrown over it; and on examining the skeleton, it was discovered that the breast-bone had been sawn asunder to extract the heart, in pursuance to a wish of Bruce that his heart should be sent to the Holy Land. There remained, therefore, no doubt, says Mr. Tytler, that after the lapse of nearly five centuries, the countrymen of Bruce were permitted, with a mixture of delight and awe, to behold the bones of their great deliverer.

The circumstances of the discovery of the tomb of Bruce have been narrated by Mr. Burn, of Edinburgh, the architect of the new edifice, in a letter to Mr. Tytler, from which we gather the following particulars:—

Great uncertainty prevailed as to the situation of the royal tombs, and the total disappearance of every vestige of the old abbey, except the exterior walls of the north aisle, required a careful investigation of the extent and proportions of the ancient edifice, not only with a view to determine its connection with the existing building, but to establish, if possible, the accuracy of Fordun regarding the tomb of Bruce.

Previous to the commencement of the excavations for the new church, the whole site bore the general appearance of the church-yard, a considerable portion of it being used as burial ground, and the remainder covered with soil and grass. Proceeding from the north aisle

wall, Mr. Burn followed the foundations of the original building at a depth of from one to five feet under the surface, and thus discovered the whole extent and form of the exterior walls, by which he was enabled to determine the centre line, and fix the position of the choir.

On the forenoon of the 17th February, 1818, two labourers employed in excavating and clearing out the soil and rubbish, discovered a stone coffin, or tomb, in the direct line of the centre of the building. The stones of this tomb were more carefully jointed and worked than any others which had been examined. The whole covering consisted of two strong flags, neatly hewn, that across the head 28½ inches wide, and 18 inches long, and the other 28½ inches wide, and 6 feet long; the latter being perfectly flat across the whole surface; but the former, or head stone, at the east end, sloped gently upwards from each side towards the centre, forming an apex about three-quarters of an inch above the level of the larger stone.

Having now a full view of this tomb, I directed the head-stone to be carefully removed; and the instant a glance was obtained of the interior, all my doubts were satisfied, and my highest expectations realized, as, even from the partial view that was obtained, there was evidence of royalty; and the form of a crown that was given to the lead covering over the head, and the sparkling fragments of gold which covered the surface, confirmed this highly important fact. The under stone was now removed, and then the entire figure was fully seen; the whole lead casing having evidently been covered over with cloth of gold, from the fragments that were found on every part, and the glittering particles still remaining on the surface. The lead at the toes was considerably decayed; and a spot on the forehead, about the size of a crown piece, had also been consumed; but in every other situation it appeared perfectly entire, and retained all the shape and roundness of form which it must have originally possessed. And it may be worthy of remark that the small exposed spot on the forehead, at the opening of the tomb, presented the appearance or colour of the skin, and exhibited a striking contrast to the decay that had taken place at the toes.

Convinced beyond doubt that this was the body of King Robert, Mr. Burn caused the stones to be immediately replaced, and the tomb secured against all further interference, and reported to the Barons of the Exchequer on the subject.

On the 5th November, 1819, the tomb was again opened in the presence of the Barons of the Exchequer, several literary gentlemen from Edinburgh, the magistrates of the town of Dunfermline, and the neighbouring gentry. Mr. Burn says "that a great change had taken place in the appearance of the body; the lead in many places had fallen in and exposed portions of the bones. A cast of the scull having been taken, the stone coffin in which the remains lay was filled with melted pitch; it was then built over with masonry, and the pulpit of the new church now marks the spot where the remains of the patriotic warrior have so long slumbered."

The balustrade round the steeple of the new church contains the words in massive stone letters, each word occupying a side, "King Robert the Bruce."

The true philosophic spirit is more valuable than any limited attainments in philosophy. It is a spirit which is quick to pursue whatever is within reach of human intellect, but is not less quick to discern the bounds that limit every human inquiry, and which, therefore, in seeking much seeks only what man may learn, which knows how to distinguish what is just in itself from what is merely accredited by illustrious names, adopting a truth which no one has sanctioned, and rejecting an error of which all approve, with the same calmness as if no judgment were opposed to its own; but which, at the same time, alive with congenial feeling to every intellectual excellence, and candid to the weaknesses from which no excellence is wholly privileged, can dissent and confute without triumph, as it admires without envy, applauding gladly whatever is worthy of applause in a rival system, and venerating the very genius which it demonstrates to have erred.—Dr. T. Brown.

ON DEPOSITS FROM WATER.

It is believed that every known form of matter may, under certain degrees of heat and pressure, exist either in the solid, or liquid, or gas-like state. Lead, for example, is a solid body at a common heat, while quicksilver remains fluid, and carbonic acid, as it escapes for instance from fermenting beer, is a gaseous form of matter. But expose the lead to intense heat, and it melts into a liquid; place it upon burning charcoal, in a stream of oxygen gas, and it boils with a blue flame, throwing off a dense yellow smoke. These changes are reversed when carbonic acid gas is powerfully compressed in a machine made for that purpose. The atoms of the gas are forced nearer each other until they form a liquid; when the pressure is withdrawn the particles, or atoms, fly asunder with immense rapidity. Now, it should be observed that a certain quantity of heat is always necessary to effect this, and the immediate loss of heat is so great, that long before the whole of the liquid carbonic acid can be evaporated, the remainder is actually frozen into a solid snow-like substance—a beautiful instance of the sudden and enormous quantity of heat required to change a liquid into the gas-like state.

Again, if some mercury be put into a saucer, and covered by a portion of the solid carbonic acid, together with the addition of a few drops of ether to increase the cold, the liquid metal will be instantaneously frozen. On the other hand, it will boil and become a vapour, if exposed to a heat more than three times greater than that of boiling water. If, indeed, man could command a greater range of heat and cold, and mechanical pressure, than he now possesses, it is believed he might change the hardest solid into gas, and freeze even the viewless winds; in short, that it is in the nature of matter, of whatever kind, to exist, either in the solid, liquid, or gaseous form.

But increased heat is not always required to turn a solid to the liquid form. A liquid, such as water, may possess greater attraction for the particles of certain solid bodies than those particles do for each other, in which case it is said to dissolve them,—to unloose the power that firmly knit the atoms into a compact mass, and to scatter them throughout the liquid. It is thus that sugar is taken up by water, and we are familiar with other instances of the dissolving power of common liquids taking place upon a small scale. We will now turn our observation to similar phenomena that occur upon a broader plan in the general economy of nature, to see more particularly what materials are being dissolved in the waters of the globe, and to watch the re-appearance of these again in a solid form.

Water is the most general and useful of all solvents, and CARBONATE OF LIME is the most abundant ingredient of our planet. It is, therefore, natural to conclude, which is the fact, that this carbonate exists in all river and spring water, and consequently in the ocean. Carbonate of lime does not, however, easily dissolve in pure water, but is readily taken up by water containing carbonic acid gas. The *petrifying* well at Matlock affords water made acid by containing carbonic acid, which dissolves a large quantity of carbonate of lime. The process of *petrifaction* changes the matter of a plant or animal into stone: but the so-called Petrifying Well of Matlock* merely coats over substances with a layer of carbonate of lime, the acid gas, meanwhile, flying off into the atmosphere.

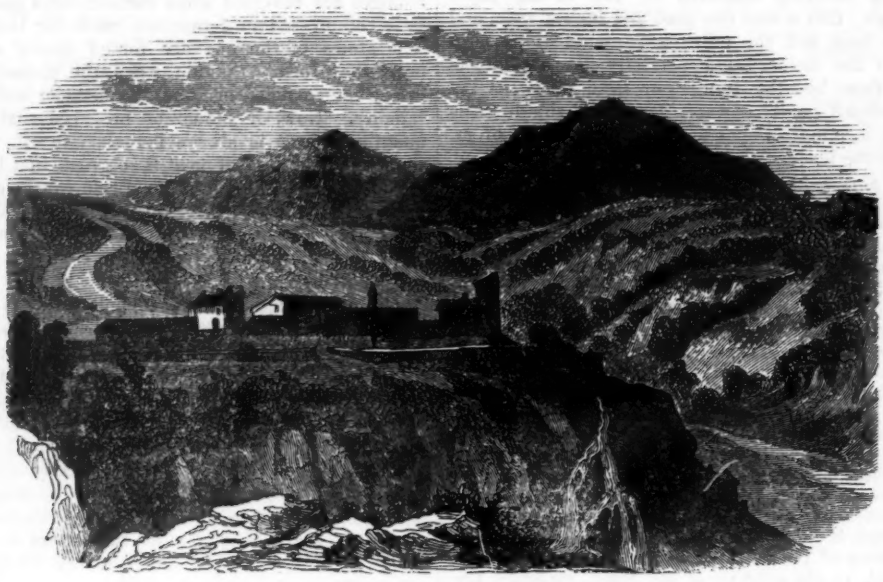
The Dropping Well at Knaresborough, in Yorkshire†, forms another example of a native lime-spring. At Sansadarrah, in the Himalaya mountains, is a rock which extends like the roof of an open piazza, for the length of about one hundred and fifty feet, through which a lime-spring continually distils. It may be well

* See *Saturday Magazine*, Vol. X., p. 71.

† See *Saturday Magazine*, Vol. IV., p. 25; and Vol. VI., p. 183.

compared to a vast filter. A small stream which runs down the sides of neighbouring mountains, falls upon, and is drunk up by, the porous rock of Sansadarrah, through which it weeps into a basin at a considerable depth below. The roof of the rocky cavern is covered with dropping stalactites, like stony icicles; the basin is likewise encrusted with limestone, and in some places the deposits from the ceiling have met the rising growths from below, and present the appearance of clustered pillars.

Italy is remarkable for the number of her lime-waters. A stream near Radicofani, in the south of Tuscany, lets fall a solid mass of limestone, to the depth of six inches in a year, in a conduit pipe which conveys its waters to some baths. At the Baths of San Filippo, not many miles distant from Radicofani, medallions in basso-relievo are manufactured by exposing artificial casts to a shower of filtered lime-water; and in the basin where the waters that feed the baths are spent, a rock thirty feet in thickness has been formed in the course of about twenty years.



BATHS OF SAN FILIPPO.

The carbonate, however, is not the only salt of lime that enters into the composition of these rocky growths. Nearly all spring and river water contain also the sulphate of lime, and this is abundant in such as are called hard. It is by reason of the presence of this salt that hard water is slightly nauseous in taste, and is unfit either for cooking or for washing. When peas are soaked in it for the purpose of making soup, they do not soften properly, and in washing, the acid in the salt unites with the alkali of the soap, while the fatty portion (of the soap), combining with the lime, forms a white curdy matter which will not dissolve in water.

But whichever of these two salts of lime, and frequently both, are held in solution, the dissolving action of water is to be considered as a process taking place over the whole surface of our globe. These ingredients of the earth's crust are thus shifted from one region to another and deposited again in places more convenient for the use of man.

When the carbonic acid rises into the atmosphere, the water being no longer capable of holding the lime in solution, the mineral ingredients fall to the earth, and are deposited either in the form of *tufa*, called also *calc-tuff*, which is an incompact and porous rock, or in that of *travertin*, which is usually hard and semi-crystalline, forming a solid limestone rock. So vast are the deposits of travertin in south-western Italy, that this substance has for centuries constituted the usual building material in that region, and it appears that the ancient temples, as well as the gorgeous palaces, and more modern churches of Rome, and indeed, the whole of the streets and squares of this once superb city, are built of limestone, which has been deposited by lime-springs.

The formation of the lighter rock, called *calc-tuff*, or *tufa*, is described by Colonel Monteath as occurring on an extensive scale in Azerbijan. Not far from Cherak-Tcha, are the ruins of a palace, erected by Suleiman, one of the first Caliphs of Bagdat. Among these is a quadrangular structure, built round a natural basin, about 200 feet in diameter, and presenting a singular phenomenon. The water in this basin appears to be agitated by a strong spring; but on a nearer approach, this is found to be occasioned by carbonic acid gas, forcing its way through the water. The water appears to contain an unusually large proportion of the salts of lime, and the basin from whence it issues, which is 300 feet in height, is wholly composed of light, porous, calcareous tufa. The superfluous water is carried out of this fine reservoir by a small channel, and wherever it rests, a deposit of tufa immediately takes place. The whole face of the country seems to be of similar formation, and even the line of mountains in the neighbourhood, some of which have an elevation of 7500 feet, appear to their very summits to be composed of the same light deposit.—ZORNLIN'S *World of Waters*.

There is also an indirect way by which water is the solvent of the materials of future rocks. Salts of lime are contained, as we have seen, in the waters of the ocean. The same substances form the hard matter of shells and corals. They also enter into the rocks that are forming at the bottom of existing seas. The amounts of lime in these three sources, namely, the sea, shells and corals, and limestone rocks, are far from being constant quantities. Large volumes of calcareous matter (or the matter of lime) are being hourly taken up from water, by the vital functions of marine animals. This matter is in the first instance partly laid up within these creatures while they live, serving as the hard support of their various skeletons, and in part it is excreted; ultimately the whole sinks to the bottom of the sea, forming in the course of ages limestone rocks of enormous thickness; exactly as the earlier forests breathed in carbon from an atmosphere loaded with carbonic acid, and partly laid it up as woody matter, and voided part as vegetable mould; both wood and mould ultimately accumulating into carbonaceous rocks, or coal, which now furnish fuel to a civilized world. In a room of the *British Museum* that has just been opened for

the display, principally, of chalky fossils, is a specimen labelled, "Deposit now taking place in the British Channel, about twenty miles from land, opposite Brighton." This is made up of the remains of shells of the same species as may be picked up on the neighbouring coast, cemented together by calcareous matter. An unpractised eye would not be able to distinguish this specimen from some of the shelly limestones that occur abundantly in the inland counties, at great elevations above the level of the ocean. In fact, there is no difference between the two, except as to the period of time when either was thrown down from water, and as to the actual animals of which they are in part composed. The agency, namely, animal function separating solid lime from its solution in water, is the same in both, just as vegetable function separated solid carbon from its solution in air, both to be afterwards laid up, the one as coal, the other as limestone, for the fuel and building materials of future generations of mankind.

Common salt is the most abundant ingredient in the waters of the ocean, but the bitter flavour and clamminess of these waters are owing to the presence of magnesian salts. The average quantity of salt varies in different seas; the waters of the Southern Ocean contain more than those of the Northern, those of the Mediterranean more than the open ocean, and those of the Dead Sea hold in solution one fourth of their own weight, according to an analysis by Dr. Marcet. The plain which extends to the south of the Dead Sea, forming a continuation of the Valley of the Jordan, presents a saline and sandy surface.

Springs sometimes become saline by rising through subterranean rocks of salt. Droitwich, in Worcestershire, has long been celebrated for its brine-springs. In the richest of these springs a hard bed of gypsum lies at a depth of from thirty to forty feet below the surface, and through this a bore has been made, which affords an outlet for a subterranean river of brine that flows over a bottom of rock-salt. The brine of this spring is of great purity, and produces, by artificial evaporation, an annual harvest of 700,000 bushels of salt.

Beautiful analogies meet us at every step in this interesting path of study. We have mentioned the extent to which carbonate of lime is separated from sea-water by shell-fish and corals, to be thrown down again together with, and as a portion of, their remains, as solid limestone. We have now to observe that springs containing iron (usually termed chalybeate springs), abound in animalcules which take up the metallic principle so largely, that the red rust observed upon the surface and along the margins of these waters is proved, by the microscope, to consist of the skins of these minute animals. It is, indeed, believed that bog-iron ore owes its origin to the caking together of the remains of myriads of these animalcules.

Flint is another body that is dissolved by water in variable quantities. The varnish on the surface of common straw, and the thicker coating which covers the bamboo, consist of *silica*, or the matter of flint, which must have been absorbed and been deposited again in a liquid state. And so, the stems of stoneworts (botanically, *charæ*), a genus of water-plants, are found to be clad with a coating of carbonate of lime.

The Geysers of Iceland* are examples of springs holding large quantities of flint in solution. These sources are of a great heat, and as soon as the water is cooled down by exposure to air, the flint is deposited in rocks similar to those of calc-tufa produced by the evaporation of lime-waters. Without the aid of heat, water will dissolve but an inconsiderable quantity of flint. The stony deposit from flint-springs is called *sinter*. The great Geyser of Iceland rises out of a spacious basin surrounded by a mound of sinter encrusted in forms which have been compared to heads of cauliflowers, produced by the splashing of the water. The inside of the basin is lined with a flinty crust of a whitish colour, and has a smooth surface. The leaves of the birch and willow are met with, converted into white stone, and in a state of the most perfect preservation. Portions of plants may also be observed to be encrusted with sinter, as the same bodies become covered with calc-tufa, when placed in the water of lime-springs.

One of the products of the Geysers is TRIPOLI, a substance in use for polishing metals, &c.

The researches of Professor Ehrenberg have disclosed the fact, that the tripoli of Bilin, in Bohemia, consists almost entirely of flinty shields of fossil infusoria, apparently deposited in successive layers. It would be an interesting point to ascertain whether the tripoli of Iceland be of similar formation; for if, indeed, like the former, the silex (flint) it contains consists of the coverings of infusoria, it may lead us to suppose that these minute creatures are not only adapted for existing in water at a high temperature, but that probably they may actually require it for their development. An additional proof would thus be afforded that every condition of things on the earth's surface is suited to afford sustenance to living creatures.—ZORNLIN'S *World of Waters*.

The flints which occur so abundantly in the upper chalk, are mostly stony infiltrations of sponges and sponge-like animals. The mealy white powder to be seen on the surface of these flints is composed of the chalky remains of fossil animalculæ, which, together with those of tripoli, and of chalybeate springs, above mentioned, afford another class of singularly interesting analogies.

In the volcanic regions of Monte Cerboli, in Tuscany, are some remarkable boiling lakes that produce a daily harvest of from 7000 to 8000 pounds of BORACIC ACID, a substance which is chiefly used by workers in metals to promote the melting of those bodies. Boracic acid also exists in the hot springs of the Lipari Islands.

Soda-lakes exist in various parts of the world, as in Hungary, Egypt, and in Maracaybo, one of the provinces of Venezuela, in South America. In the province of Gahena, near Fezzan, in Africa, soda occurs, as also in the above mentioned districts, in the form of a carbonate. Hard crystalline masses of this deposit (similar in its formation to lime-*tufa*, and flint-*sinter*,) remain unaltered by exposure to air, and are said to have furnished material for the walls of a neighbouring fort.

The celebrated Natron, or Soda, Lakes, that lie along the valley of the Nile, are fed by the annual risings of that river, and the soil through which the waters filter, appears to be strongly charged with soda. As the heat of the sun dries up a portion of the water, a crust of carbonate of soda is deposited in the bed of the lakes, ready for the use of man, who collects it annually for the manufacture of glass and other useful purposes.

Such are a few instances of the use of water in the economy of the earth, as a solvent and locomotive of solid matter, that is to be afterwards deposited in places more convenient for supplying the materials of the arts. The phenomena are well calculated to excite admiration by the simplicity of the means, and to satisfy our minds when we view the largeness of the results. We have seen that the solid materials of rocks frequently correspond with the substances that are in solution in mineral springs. It has further been observed, that the gas-like matter which issues from volcanoes also corresponds in a remarkable manner with the elements with which these springs are charged. Here we see the materials of the globe continually shifting their place, being changed in form while they keep to the same chemical nature.

The number of partial observations that must be made by various persons, at distant times and places, in order to establish one general truth of science, must not

* See *Saturday Magazine*, Vol., I., p. 25.

blind us to the actual simplicity of these mighty changes. The insignificance of natural agents, compared with the magnitude of their results, is doubtless a provision to hinder the eye from resting on visible and second causes, instead of looking through the veil of matter up to the beneficent Governor of the universe. It is thus that nature speaks to the listening ear of Faith,

In language universal to mankind—
A language, lofty to the learn'd; yet plain
To those that feed the flock, or guide the plough,
Or, from the husk, strike out the bounding grain:—
A language, worthy the GREAT MIND that speaks—
Preface, and comment, to the sacred page.

F.

THE duty of obedience appears to be prior even to that of love; since the duty of love implies a purified and exalted state of affection to which we are to attain. But obedience lies at the very beginning of duty. It may be the very first act of our will turning itself towards God. Besides, every the least wilful failure of obedience is a positive act of revolt. We obey, or we disobey. And hence there seems in our own nature, nothing more elementary, essential, and indispensable, to every part of religion, than the actual performance of this duty.—ANON.

THE CHRISTMAS MEETING.

ON rolled suns and seasons—the old died—the elderly became old—and the young, one after another, were wafted joyously away on the wings of hope, like birds, almost as soon as they can fly, ungratefully forsaking their nests, and the groves in whose safe shadows they first essayed their pinions; or, like pinnaces, after having for a few days trimmed their snow-white sails in the land-locked bay, close to whose shores of silvery sand had grown the trees that furnished timber both for hull and mast, slip their tiny cables on some summer-day, and gathering every breeze that blows, go dancing over the waves in sunshine, and melt far off into the main! Or, haply, some were like fair young trees, transplanted during no favourable season, and never to take root in another soil, but soon leaf and branch to wither beneath the tropic sun, and die almost unheeded by those who knew not how beautiful they were beneath the dews and mists of their own native clime. Vain images! and therefore chosen by fancy not too painfully to touch the heart! For some hearts grow cold and forbidding in selfish cares—some, warm as ever in their own generous glow, were touched by the chill of fortune's frowns, that are ever worst to bear when suddenly succeeding her smiles—some, to rid themselves of painful regrets, took refuge in forgetfulness, and closed their eyes to the past—duty banished some abroad, and duty imprisoned others at home—estrangements there were, at first unconscious and unintended, yet, ere long, though causeless, complete—changes were wrought insensibly, invisibly, even in the innermost nature of those who had been friends—unrequited love broke some bonds—requited love relaxed others—the death of one altered the conditions of many—and so—year after year—the CHRISTMAS MEETING was interrupted—deferred—till finally it ceased. For when some things cease—for a time—that time turns out to be for ever. Survivors of those happy circles! wherever ye be—should these imperfect remembrances of days of old, chance, in some thoughtful pause of life's busy turmoil, for a moment to meet your eyes, let there be a few throbs of revived affection in your hearts—for his, though "absent long, and distant far," has never been utterly forgetful of the friendships that charmed his youth. To be parted in body is not to be estranged in soul—and many a dream—and many a vision, sacred to nature's best affections, may pass before the mind of one whose lips are silent. "Out of sight out of mind," is rather the expression of a doubt—of a fear—than of a belief or conviction. The soul surely has eyes that can see the object it loves, through all intervening darkness—and of those more especially dear, it keeps within itself almost undimmed images, on which, when they know it not, think it not, believe it not, it often loves to gaze, as on a relic imperishable as it is hallowed.—*Christmas Dreams.*

HEALTH OF EUROPEANS IN INDIA.

OF the nineteen youths with whom I commenced my juvenile career in India, seventeen died in India many years before my departure; one only besides myself then survived; with whom I formed an early friendship, which continued without interruption to his death, for he also has since fallen a sacrifice to the climate, and I have been for nearly ten years the only survivor.

"Within what narrow limits," says Pliny, "are the lives of so great a multitude confined! To me, therefore, the tears shed upon a reflection of this kind, seem not only pardonable but worthy of praise; for they say that Xerxes, after a review of his immense army, wept to consider, that of such a number of men, in a very little time, not one would be living. Yet as it may not be permitted us to live long, let us leave something behind to show that we have lived. Noble is the contention, when friends, by mutual exhortations, spirit up each other to the love of immortality."

What in my opinion produces so material a difference in the character and career of the youth sent to India, is *the employment of time*, especially in the morning. The writers, at the period of my arrival at Bombay, and during the whole time of my officiating in that capacity, were fully engaged from nine o'clock to twelve, when they retired from their respective offices to dinner, which was then at one o'clock in every class of English society. At two the writers returned to their employment until five, when, after a dish of tea, a social walk on a fine sandy beach, open to the salubrious western breeze, gave us a keen appetite for supper. Such was our practice six days in the week. The cadets, on the contrary, who were then soon promoted, had abundance of leisure time. The morning was generally occupied in calling upon each other at their different quarters, and at each visit taking a draught of punch, or arrack-and-water; which, however cool and pleasant at the moment, was succeeded by the most deleterious effects. I do not mean that physical causes, independent of one's personal habits, have no effect upon the European constitution in India. It must be admitted that, notwithstanding the utmost care and circumspection, these frequently produce a gradual and melancholy effect, especially on delicate females, who uniformly lead a life of temperance, tranquillity, and virtue. But I am persuaded that moral evil produces far more fatal consequences than any physical cause whatsoever.

I was one day in company at Bombay, with twelve other gentlemen in the civil service, most of them considerably under thirty years of age, when the conversation turning upon the mortality of Europeans in India, one of the company made use of the old and superstitious remark, that there was something ominous in the number thirteen at a convivial meeting, and that certainly one would die before the anniversary of that day in the following year; the probability of which was certainly much in his favour, in a climate deemed so inimical to European constitutions. I was, at the moment, cutting open the leaves of a book with an ivory paper-cutter; and merely to keep in mind the predicted death of one of the company within twelve months from the assertion, I wrote down on the ivory the name of each individual comprised in the fatal number: this was in the year 1770. The ensuing year passed over without the completion of the prophecy; not one of the company died. In 1780, ten years after I made my nomenclature, the whole thirteen were in perfect health. The party consisted of the secretary, deputy secretary, and eleven assistants in their office, writers in the Company's service.

This fact evinces the advantages of moderation, employment, and diligence.

[*Abridged from* FORBES' *Oriental Memoirs.*]

INORDINATE fear of man is an implicit forgetting of God.

THE expectation of being pleased, which prevails so much in young persons, is one great source of their enjoyments. All are felt before-hand, and their hopes are not easily given up; the conviction, that they shall be pleased, makes a strong impression on the imagination, which often lasts long enough to make them really so, when otherwise they would have found little reason for it. This illusion cannot, nor is it desirable that it should, be preserved, but the disposition to be pleased may yet remain, and there is hardly anything of so much importance to the happiness of life.—BOWDLER.

THE SHEPHERD'S DOG.

II.

THE history of the faithful "Sirrah," which was given in an abridged form in a late number of this work, does not present more remarkable features than that of many dogs of his kind; indeed, were there an Ettrick Shepherd to note the characteristics of these sagacious creatures, as they might be studied on every farm where sheep are kept, many would be the amusing and interesting narratives of shepherds' dogs. But we have still another little history to give from the same source as the last, and being so far in connection with it that the "renowned Hector," now to be described, was the son and immediate successor of the faithful old Sirrah.

Though not so valuable a dog as Sirrah, Hector was a far more interesting one. He had "three times more humour and whim," and yet with all his talents, there was a grain of stupidity tincturing all his bravest acts. In proof of this it is recorded that, after a wearisome journey with some lambs, which being newly weaned had proved themselves exceedingly unruly, Hector and his master at length reached home, after it was dark, and candles were obliged to be procured in order to fold the lambs. After closing them safely up, the shepherd went home to supper, but when the usual portion was set down for Hector, the dog was missing. His master went to the door, which was within call of the sheepfold, and called and whistled for some time, but Hector did not make his appearance. This caused some vexation in the family, for the lambs were to be taken to market the next day, and it would be impossible, they knew, to drive them a mile without the dog's help. On going to the fold at break of day on the following morning, they soon saw how it was. The darkness of the night had prevented the dog from observing that the lambs were securely shut in on every side, and therefore he had persisted in guarding what was already safe. "There was poor Hector sitting trembling in the very middle of the fold door, on the inside of the flake that closed it, with his eyes still steadfastly fixed on the lambs. He had been so hardly set with them after it grew dark, that he durst not for his life leave them, although hungry, fatigued, and cold, for the night had turned out a deluge of rain. He had never so much as lain down, for only the small spot that he sat on was dry, and there had he kept watch the whole night. Almost any other colley would have discerned that the lambs were safe enough in the fold; but Hector had not been able to see through this. He even refused to take my word for it, for he durst not quit his watch, though he heard me calling both at night and morning."

This anecdote is illustrative of Hector's singular quality of keeping true to the charge to which he was set. At shearing time, or in sorting sheep in any way, when a division was turned out, and Hector got the word to attend to them, he would do it pleasantly for a whole day without the least symptom of weariness. No noise or hurry about the fold had the least effect upon him. But in commanding wild sheep on steep ground, where they are most difficult to manage, he was inferior in skill to his sire.

One of Hector's amusing peculiarities was his antipathy to the "family mouser," which was exhibited from his very puppy-hood; "yet so perfectly absurd was he," says his master, "that no impertinence on her side, and no baiting on, could ever induce him to lay his mouth on her, or injure her in the slightest degree. There was not a day, and scarcely an hour passed over, that the family did not get some amusement from these two animals. Whenever he was within doors his whole occupation was watching and pointing the cat from morning to night. When she flitted from one place to another so did he in a moment, and then squatting down, he kept his point sedulously till he was either called off or fell asleep."

Hector was so far from being a greedy dog, that it was often difficult to make him take his food. On these occasions the cat was brought in, and he would then cast malicious looks at her from under his eyebrows, and draw near the prepared meat; but it was not until she approached to share it with him that he would begin to eat it, when he set to lapping furiously in utter desperation.

Mr. Hogg entertains so high an opinion of the sagacity of the shepherd's dog, that he declares he scarcely ever saw one of these animals do anything without perceiving his reasons for it, and he generally found them very cogent ones. But Hector had a droll stupidity about him, and took up forms and rules of his own, for which it was difficult to perceive any motive. One of these is excessively ludicrous in the way our author gives it, though we doubt whether our readers will ascribe the actions of the dog to the cause his master speaks of. "Hector had one uniform practice, and a very bad one it was, during the time of family worship, that just three or four seconds before the conclusion of the prayer he started to his feet, and ran barking round the apartment like a crazed beast. My father was so much amused with this, that he would never suffer me to correct him for it, and I scarcely ever saw the old man rise from the prayer without his endeavouring to suppress a smile at the extravagance of Hector. None of us could ever find out how he knew that the prayer was near done, for my father was not formal in his prayers, but certes he did know; of that we had nightly evidence. There never was anything for which I was so puzzled to find a reason as this; but from accident I did discover it, and, however ludicrous it may appear, I am certain I was correct. It was much in character with many of Hector's feats, and rather, I think, the most *outré* of any principle he ever acted on. As I said, his chief daily occupation was pointing the cat. Now when he saw us all kneel down in a circle, with our faces couched on our paws, in the same posture as himself, it struck his absurd head, that we were all engaged in pointing the cat. He lay on tenters all the time, but the acuteness of his ear enabling him through time to ascertain the very moment when we would all spring to our feet, he thought to himself 'I shall be first after her for you all!'"

Another anecdote of Hector's sagacity, and we must close our notice of this amusing animal. Mr. Hogg is quite convinced that Hector understood a good part of what was passing in the family circle, especially all that was said about himself, the sheep, the cat, or a hunt. At such times his attention and impatience were manifest; and on one occasion he gave good proof that he understood the conversation that was going on. It would destroy the zest of the story to give it in other words than those of the shepherd himself.

One winter evening, I said to my mother that I was going to Bowerhope for a fortnight, for that I had more conveniency for writing with Alexander Laidlaw than at home; and I added, "But I will not take Hector with me, for he is constantly quarrelling with the rest of the dogs, singing music, or breeding some uproar."

"Na, na," quoth she, "leave Hector with me; I like aye best to have him at hame, poor fallow."

These were all the words that passed. The next morning the waters were in a great flood, and I did not go away till after breakfast; but when the time came for tying up Hector, he was wanting. "I will wager," said I, "that he heard what we were saying yesternight, and has gone off for Bowerhope as soon as the door was opened this morning."

"If that should really be the case, I'll think the beast no canny," said my mother.

The Yarrow was so large as to be quite impassable, so I had to go up by St. Mary's Loch, and go across by a boat; and on drawing near to Bowerhope, I soon perceived that matters had gone precisely as I suspected. Large as the Yarrow was, and it appeared impassable for any living creature, Hector had made his escape early in the morning, had swam the river, and was sitting "like a drookit hen" on a knoll at the east end of the house, awaiting my arrival with much impatience. I had a great attachment for this animal, who with a good deal of absurdity joined all the amiable qualities of his species. He was rather of a small size, very rough and shagged, and not far from the colour of a fox.

THE ETTRICK SHEPHERD'S ADDRESS TO HIS AULD DOG, HECTOR.

COME, my auld towzy trusty friend,
What gars ye look sae dung wi' wae?
D'ye think my favour's at an end
Because thy head is turnin' gray?

Although thy strength begins to fail,
Its best was spent in serving me,
An' can I grudge thy wee bit meal,
Some comfort in thy age to gie?

For mony a day, frae sun to sun,
We've toiled fu' hard wi' ane anither;
An' mony a thousand mile thou'st run
To keep my thraward flocks thegither.

Ah me! o' fashion, self, an' pride,
Mankind hae read me sic a lecture!
But yet it's a' in part repaid
By thee, my faithful, grateful Hector!

O'er past imprudence, oft alane
I've shed the saut an' silent tear;
Then, sharin' a' my grief an' pain,
My poor auld friend came snoosin' near.

Wi' waesome face an' hingin' head,
Thou wad'st hae press'd thee to my knee;
While I thy looks as weel could read,
As thou hadst said in words to me:—

"O my dear master, dinna greet,
What hae I ever done to vex thee?
See here I'm cowrin at thy feet,
Just take my life, if I perplex thee.

"For a' my toil, my wee drap meat
Is a' the wage I ask of thee;
For whilk I'm oft obliged to wait
Wi' hungry wame an' patient e'e.

"Whatever wayward course ye steer;
Whatever sad mischance o'ertake ye;
Man, here is ane will hald ye dear!
Man, here is ane will ne'er forsake ye!"

Yes, my puir beast, though friends me scorn,
Whom mair than life I valued dear,
An' thraw me out to fight forlorn,
Wi' ills my heart do hardly bear,

While I hae thee to bear a part,—
My health, my plaid, and heezle rung,—
I'll scorn th' unfeeling haughty heart,
The saucy look, and slanderous tongue.

For He who feeds the raven's young,
Let's naething pass [illegible] isna see;
He'll sometime judge [illegible] ht a[illegible]w ang,
An' aye provide for you an' me.

IT is the aim of an enlarged and cultivated mind to found right feelings upon true judgments.

THE heavens afford the most sublime subject of study which can be derived from science. The magnitude and splendour of the objects, the inconceivable rapidity with which they move, and the enormous distances between them, impress the mind with some notion of the energy that maintains them in their motions, with a durability to which we can see no limit. Equally conspicuous is the goodness of the Great First Cause, in having endowed man with faculties, by which he can not only appreciate the magnificence of His works, but trace, with precision, the operation of His laws, use the globe he inhabits as a base wherewith to measure the magnitude and distance of the sun and planets, and make the diameter of the earth's orbit the first step of a scale by which he may ascend the starry firmament. Such pursuits, while they ennoble the mind, at the same time inculcate humility, by showing that there is a barrier which no energy, mental or physical, can ever enable us to pass; that, however profoundly we may penetrate the depths of space, there still remain innumerable systems, compared with which those apparently so vast must dwindle into insignificance, or even become invisible; and that not only man, but the globe he inhabits,—nay, the whole system of which it forms so small a part,—might be annihilated, and its extinction be unperceived in the immensity of creation. —SOMERVILLE.

CURIOUS CHESS PROBLEMS. V

ON a former occasion (page 92 of the present volume) we borrowed from *Le Palamède* a beautiful little problem in which White was to mate in two moves. The ingenuity of the solution has been so much admired, that we are tempted to offer another problem from the recently published number of the same periodical. In its structure this problem resembles the former, and is probably by the same author, but while it is equally ingenious it is more difficult, for while in that the mate was to be given in two moves, this one requires three.

White to move, and to give check-mate in three moves.

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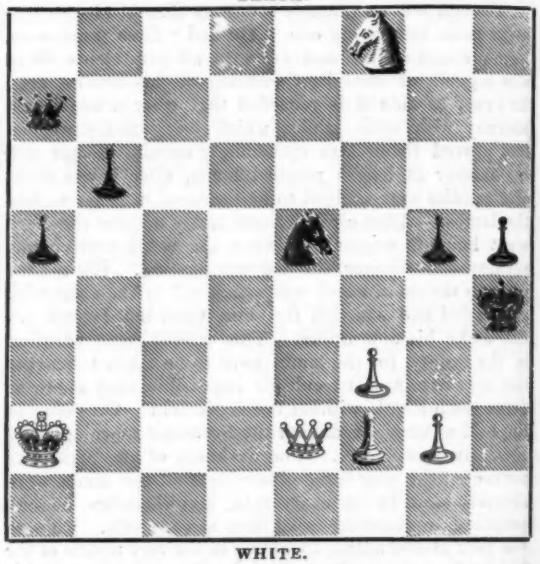

WHITE.

THERE is something most affecting in the natural sorrows of poor men, as, after a few days' wrestling with affliction, they appear again at their usual work, melancholy, but not miserable. The rich too often look upon life, more or less, as a scene of enjoyment, and amusement, and delight. Some are apt to get selfish in their sensibilities. They cherish and encourage habits of thought and feeling that are most adverse to obedience and resignation to the decrees of the Almighty, when these decrees dash in pieces small the idols o' their earthly worship. * * There's no thoughtless clamour in kintra houses, when the cloud o' God's judgment passes over them, and orders are given for a grave to be dug in the kirkyard. All the house is hushed and quiet—just as if the patient were still sick, and no gone away—the father, and, perhaps, the mother, the brothers, and the sisters, are all ganging about their ordinary business, with grave faces no doubt, and some of them now and then dashing the drops from their eyes; but, after the first black day, little audible weeping, and no indecent and impious outcries.

And so people think how callous, how insensible are the poor! that nature has kindly denied to them those fine feelings that belong to cultivated life! But if they heard the prayer o' the auld man at night, when the surviving family were on their knees around the wall, and his poor wife next him in the holy circle, they would ken better, and confess that there is something as sublime, as it is sincere and simple, in the resignation and piety of those humble Christians, whose doom it is to live by the sweat of their brow, and who are taught, almost from the cradle to their grave, to feel every hour they breathe, that all they enjoy, and all they suffer, is dropt down from the hand of God, almost as visibly as the dew, or the hail,—and hence their faith in things unseen and eternal, is firm as their belief in things seen and temporal—and that they all feel when letting down the coffin into the grave.—*Noctes Ambrosianæ*, XLIII.

JOHN W. PARKER, PUBLISHER, WEST STRAND, LONDON.